

Triplatt

Triple Attenuator / Inverter / Attenuverter / Multiplier / Adder / Mixer / DC Voltage Source

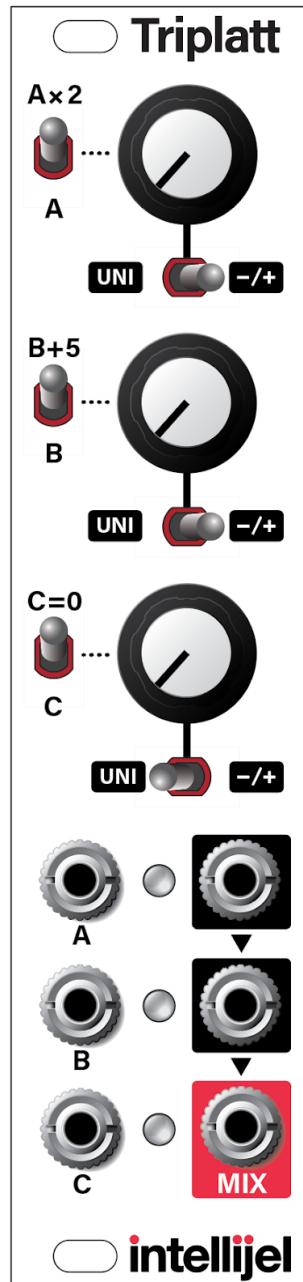


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Compliance



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Intellijel Designs, Inc. could void the user's authority to operate the equipment.

Any digital equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.



This device meets the requirements of the following standards and directives:

EMC: 2014/30/EU

EN55032:2015 ; EN55103-2:2009 (EN55024) ; EN61000-3-2 ; EN61000-3-3

Low Voltage: 2014/35/EU

EN 60065:2002+A1:2006+A11:2008+A2:2010+A12:2011

RoHS2: 2011/65/EU

WEEE: 2012/19/EU

Installation

Intellijel Eurorack modules are designed to be used with a Eurorack-compatible case and power supply. We recommend you use Intellijel cases and power supplies.

Before installing a new module in your case, you must ensure your power supply has a free power header and sufficient available capacity to power the module:

- Sum up the specified +12V current draw for all modules, including the new one. Do the same for the -12 V and +5V current draw. The current draw will be specified in the manufacturer's technical specifications for each module.
- Compare each of the sums to specifications for your case's power supply.
- Only proceed with installation if none of the values exceeds the power supply's specifications. Otherwise you must remove modules to free up capacity or upgrade your power supply.

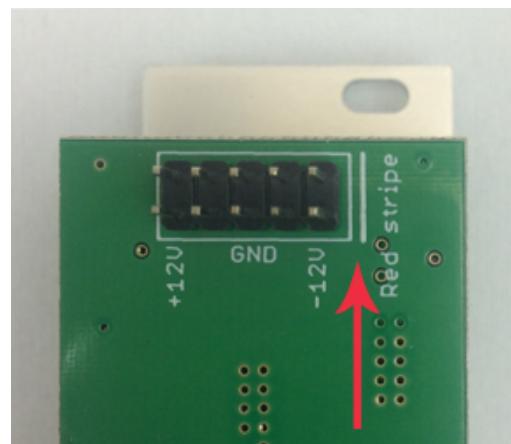
You will also need to ensure your case has enough free space (hp) to fit the new module. To prevent screws or other debris from falling into the case and shorting any electrical contacts, not leave gaps between adjacent modules, and cover all unused areas with blank panels. Similarly, do not use open frames or any other enclosure that exposes the backside of any module or the power distribution board.

You can use a tool like [ModularGrid](#) to assist in your planning. Failure to adequately power your modules may result in damage to your modules or power supply. If you are unsure, please [contact us](#) before proceeding.

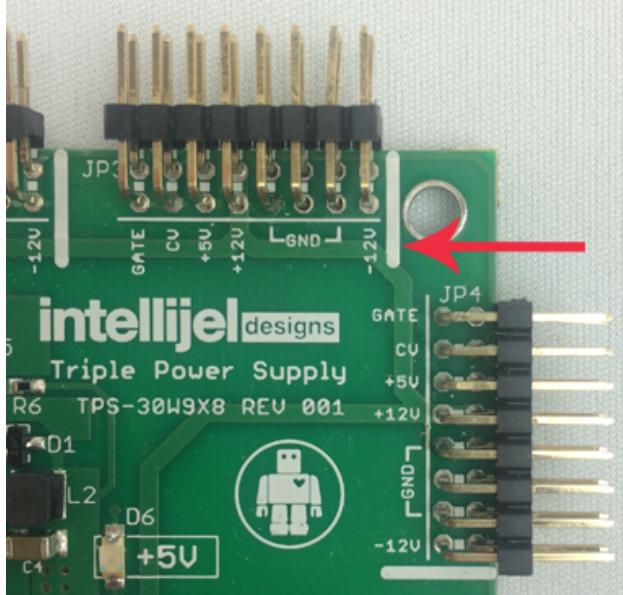
Installing Your Module

When installing or removing a module from your case always turn off the power to the case and disconnect the power cable. Failure to do so may result in serious injury or equipment damage.

Ensure the 10-pin connector on the power cable is connected correctly to the module before proceeding. The red stripe on the cable must line up with the -12V pins on the module's power connector. Different modules use different ways to indicate the -12V pins. Some may be labelled with "-12V;" a white stripe next to the -12V pins; the words "red stripe;" or some combination of these. Additionally, some modules may have shrouded headers, thus preventing backward connections.



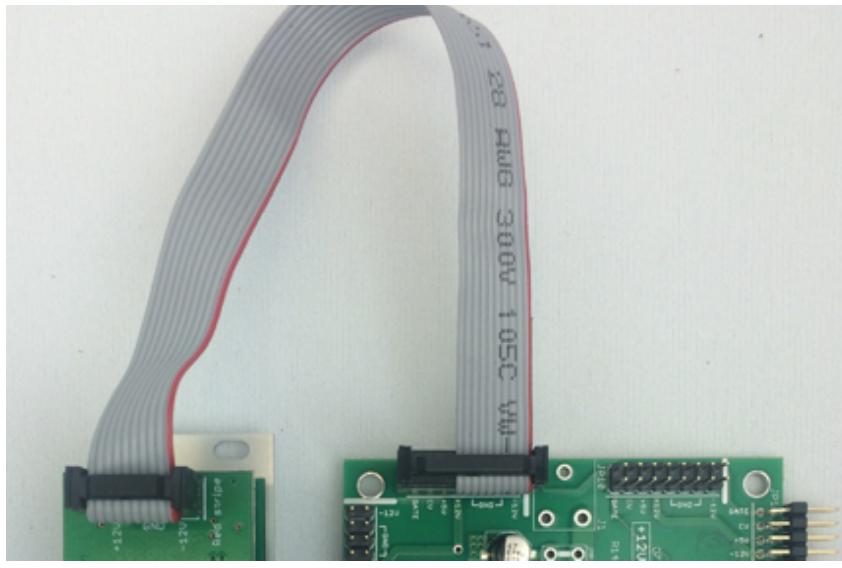
Most modules will come with the cable already connected but it is good to double check the orientation. Be aware that some modules may have headers that serve other purposes so ensure the power cable is connected to the right one.



The other end of the cable, with a 16-pin connector, connects to the power bus board of your Eurorack case. Ensure the red stripe on the cable lines up with the -12V pins on the bus board. On Intellijel power supplies the pins are labelled with “-12V” and a thick white stripe.

If you are using another manufacturer’s power supply, check their documentation for instructions.

Once connected, the cabling between the module and power supply should resemble the picture below:



Before reconnecting power and turning on your modular system, double check that the ribbon cable is fully seated on both ends and that all the pins are correctly aligned. If the pins are misaligned in any direction or the ribbon is backwards you can cause damage to your module, power supply, or other modules.

After you have confirmed all the connections, you can

reconnect the power cable and turn on your modular system. You should immediately check that all your modules have powered on and are functioning correctly. If you notice any anomalies, turn your system off right away and check your cabling again for mistakes.

Overview

Triplatt is a three-channel active/buffered attenuverter and summing mixer. Each channel has a knob, which can function as a unipolar attenuator or a bipolar attenuverter, depending on the setting of its corresponding two-position polarity switch.

Each input is normalled to a built-in +5V DC voltage source. With nothing plugged into the jacks, each knob controls a voltage range of 0 to +5 V or -5 to +5 V depending on the position of the channel polarity switch.

Each output is normalled to mix into the output of the channel below, making it possible to do sub mixes in groups of two or three.

In addition, each channel has a “special function” switch to alter its input voltage in a specific way. Channel A has a 2x voltage multiplier switch, allowing you to double the voltage sent into Channel A. Channel B has a +5V switch, allowing you to add 5V to whatever voltage is sent into Channel B. Channel C has a mute switch, allowing you to completely turn off the signal being sent into Channel C.

Front Panel

Controls

1. Channel attenuator (x3)

These knobs attenuate the voltage present at the input [A, B, or C] of each channel. The behaviour of the knob depends on the position of the **Channel Polarity Switch** [2]. The attenuation amount is linear.

2. Channel polarity switch (x3)

This switch sets the polarity of the signal sent to the output [D, E, or F] of each channel.

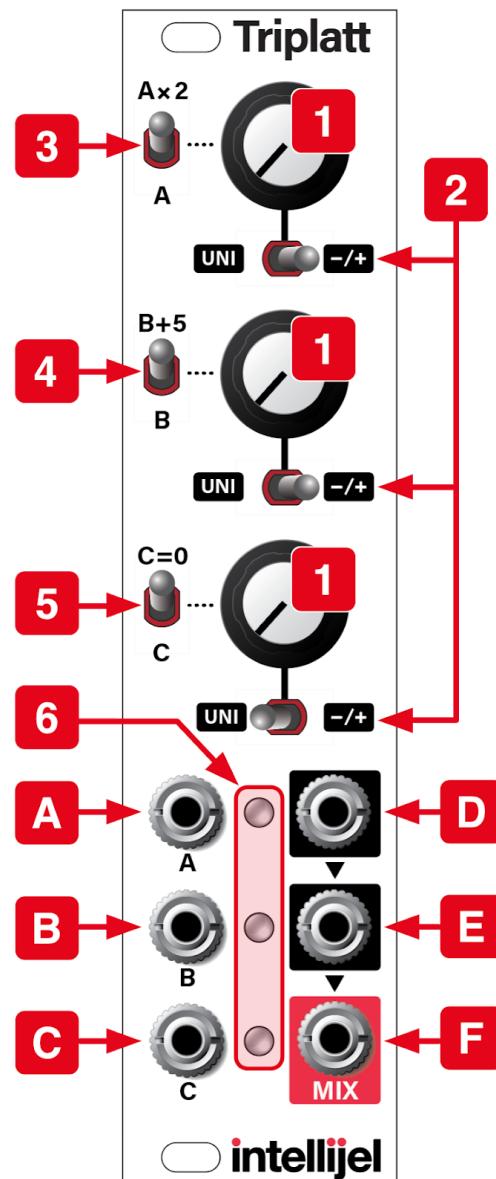
UNI: With the switch in the left **UNI** position, the channel functions as a standard attenuator. The full value of the channel's input voltage is passed through to the output when the attenuator knob is fully *clockwise*. None of the input voltage passes to the output when the attenuator knob is fully *counterclockwise*; and half the voltage passes through to the output when the knob is at the 12:00 (straight up) position.

-/+: With the switch in the right **-/+** position, the knob acts as a bipolar attenuverter. The full value of the channel's input voltage is passed through to the output when the attenuator knob is fully *clockwise*. The inverse of the input voltage is sent to the output when the knob is fully *counterclockwise*; and none of the input voltage passes through to the output when the knob is at the 12:00 (straight up) position.

3. Ax2 switch

In the up (on) position, this switch doubles the voltage appearing at Channel A's input [A].

For example: leave the input of Channel A unconnected; set the channel's polarity switch to **-/+**, turn the channel attenuator fully clockwise; and set the **Ax2** switch to the down (off) position. Triplatt will send 5V to Channel A's input [A]. Flip the **Ax2** switch to the up



(on) position, and Triplatt sends 10V (5V x 2) to Channel A's input. Rotate the knob fully counterclockwise, and Triplatt sends -10V (-5V x 2) to Channel A's input.

The **Ax2** switch is a convenient way to double the input voltage, or to set a full +10V or -10V DC offset to the signal patched into Channel B.

4. **B+5 switch**

In the up (on) position, this switch adds 5V to the input of Channel B **[B]**.

This is particularly useful for converting a -5V / +5V bipolar signal (such as an LFO) into a 0V - 10V unipolar signal (which you can then attenuate with Channel B's attenuator knob).

5. **C = 0 switch**

In the up (on) position, this switch mutes Channel C's input **[C]**, allowing you to completely turn off the channel's input, removing it from the Channel C/MIX output **[F]**.

6. **Output level/polarity LEDs (x3)**

Each LED provides visual feedback of the voltage being sent out the corresponding OUT jack. Green = positive voltage. Red = negative voltage. Brightness = absolute value of output voltage (the LED is unlit when 0V is being sent to the output jack).

Inputs & Outputs

A. IN A

Input for Channel A. The voltage sent to this input is doubled (multiplied by 2) if the **Ax2** switch [3] is on (up).

With no cable plugged in, Triplatt sends a 5V DC voltage into Channel A, which you can double to 10V ($5V \times 2$) with the **Ax2** switch on. This input input voltage can then be inverted with the polarity switch and scaled with Channel A's attenuator knob.

B. IN B

Input for Channel B. 5V is added to this input if the **B+5** switch [4] is on (up).

With no cable plugged in, Triplatt sends a 5V DC voltage into Channel B, which becomes 10V ($5V + 5V$) with the **B+5** switch on. The input voltage can then be inverted with the polarity switch and scaled with Channel B's attenuator knob.

C. IN C

Input for Channel C. The input is switched off if the **C=0** switch [5] is on (up).

With no cable plugged in, Triplatt sends a 5V DC voltage into Channel C, which becomes 0V with the **C=0** switch on. You can invert the voltage appearing at IN C using a combination of Channel C's polarity switch and attenuator knob.

D. OUT A

Output for Channel A. If nothing it plugged into **OUT A**, then its voltage is bussed to the next channel and summed with Channel B's output voltage. Plugging a cable into **OUT A** prevents it from being summed with Channel B's output, or from appearing at the **MIX** out [F].

E. OUT B

Output for Channel B. If nothing is plugged into **OUT A**, then **OUT B** contains the sum of Channel A and Channel B's output voltages.

If nothing it plugged into **OUT B**, then its voltage is bussed to the next channel and summed with Channel C's output voltage. Plugging a cable into **OUT B** prevents it from being summed with Channel C's **MIX** out [F].

F. OUT C / MIX

Output for Channel C. With no cables connected to **OUT A** or **OUT B** this output is a sum of the outputs of channels A, B, and C. Connecting a cable to **OUT A** removes its output from the mix. Connecting a cable to **OUT B** removes both A and B's outputs from the mix.

Usage Examples

These simple parameters provide a wealth of useful functions to the modular synthesist. Here are some basic examples of how you might employ Triplatt in your patches:

- **Attenuation:** Assume you want to *subtly* modulate filter resonance, but your filter of choice doesn't have a built-in attenuator on its resonance CV input. If you were to plug the output of your LFO directly into the resonance CV input on your filter, you'd be modulating it at full amplitude — meaning your LFO would cycle the resonance from "none" to "ear shattering squelch" and back again. But what if you just want resonance to undulate a little bit? Triplatt to the rescue!

Plug the output of your LFO into Triplatt's **IN A**, then plug **OUT A** into your filter's resonance CV jack. You'll now be able to "dial down" the peak-to-peak amplitude of the LFO using Triplatt's attenuator knob.

- **Inversion:** Assume you want to control a module with an envelope. Normally, voltage increases during the attack section of an ADSR, then decreases during the decay and release segments. But what if you want the inverse? What if you want some sonic attribute to get *more* pronounced as the signal decays, not less? For this you need to invert the envelope. Once again, Triplatt to the rescue!

Plug the output of your envelope into Triplatt's **IN A**, set Channel A's polarity switch to **-/+**, then turn its attenuator knob *counterclockwise* past 12:00 — an inverted envelope now appears at Triplatt's **OUT A**.

- **Voltage Offsets:** Assume you have a Sample & Hold module sending random notes to an oscillator, only you want to constrain that unruly 10 octave range of notes to just one or two octaves in the bass range. One way to do this is to use two channels of a Triplatt.

Plug your S&H output into Triplatt's **IN B**; connect **OUT B** to your oscillator's pitch input; then use the Channel B attenuator to limit the range of notes to an octave or two. Next, use Triplatt's Channel A (into which nothing is connected) to negatively offset the note range down into the bass frequencies. Do this by setting Channel A's polarity switch to **-/+**, then turn the corresponding attenuator knob *counterclockwise* past 12:00. Because nothing is plugged into Triplatt's **OUT A**, **OUT B** contains a sum of Channels A and B, giving you both the reduced note range and the lower frequencies you desire.

- **CV Mixing:** What if you want to modulate some parameter with more than one control voltage at a time? Perhaps you want to send a square wave to modulate a filter's cutoff frequency giving it a steady "pulsing" sound while simultaneously sweeping it with a slow, triangular LFO. Triplatt is on the case. And, once again, you'll be using two channels.

Plug the square wave output of the “pulsing” LFO into Triplatt’s **IN A** and connect **OUT B** to your filter’s frequency CV input. Use Channel A’s attenuverter to set the amount of pulse you want to hear. Next, plug the triangle wave output of the “slow sweeping” LFO into Triplatt’s **IN B**. **OUT B** now contains of sum of Triplatt’s A and B channels. Use Channel B’s attenuverter to set how much the pulse sweeps up and down the frequency band. You now have two different CV sources controlling one destination by varying amounts.

- **Audio Mixing:** Audio is a voltage too. So you’re probably asking yourself, “can I use Triplatt to mix multiple channels of audio together as well?” Yes, you can!

Set all of Triplatt’s polarity switches to **UNI** and turn all its knobs fully *counterclockwise*. Plug the output of one oscillator into **IN A**, another into **IN B**, and a third into **IN C**. Connect **OUT C/MIX** to your audio amplifier, and leave **OUT A** and **OUT B** unconnected. Rotate Channel A’s attenuator clockwise and you’ll hear the oscillator connected to **IN A**. Increase the Channel B and Channel C attenuators to add **IN B** and **IN C** to the mix.

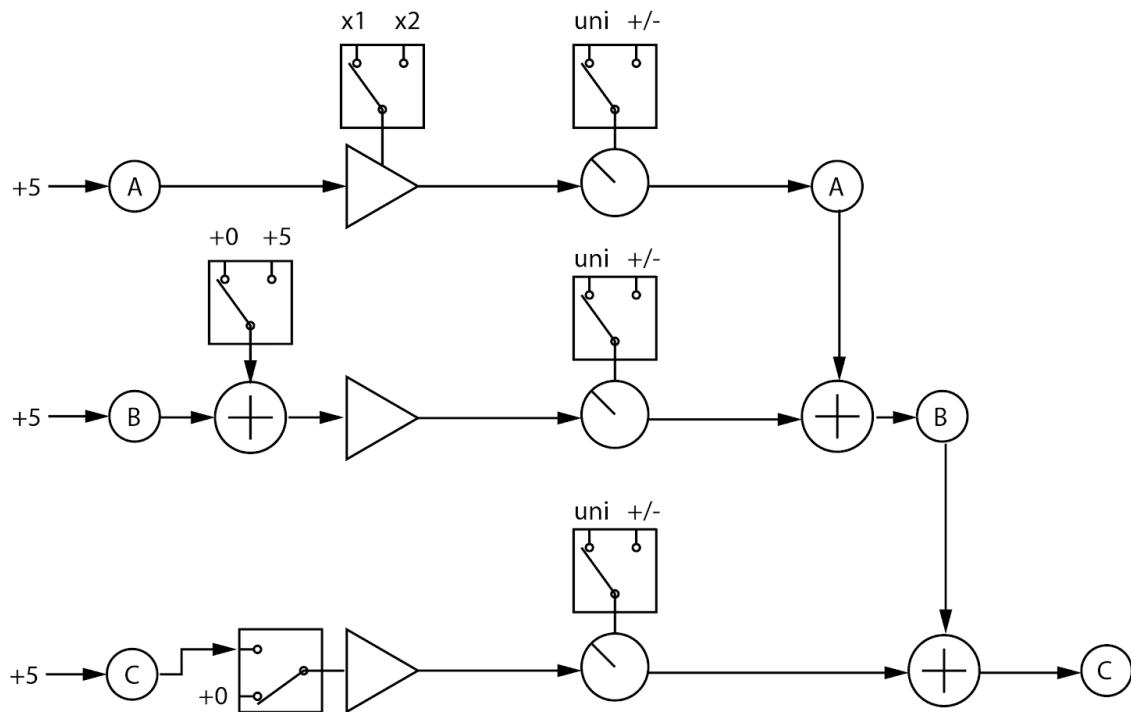
- **Instant Voltage Doubling:** Channel A has a dedicated multiplier switch, which doubles the voltage being sent to its input. This is ideal for temporarily pumping up a CV’s impact on a particular parameter, then instantly dropping it back down to its original level.
- **Bipolar-to-Unipolar Conversion:** Channel B has a dedicated +5V switch, which adds 5V to the signal arriving at its input. This is particularly useful for converting a bipolar signal (such as an LFO) into a unipolar signal. Connect the output of a bipolar LFO to **IN B**. Set Channel B’s polarity switch to **UNI**, and its attenuator knob fully *clockwise*. With the **B+5** switch in the down (off) position, the -5V to +5V bipolar LFO is sent through to **OUT B** without attenuation or conversion. Flip the **B+5** switch to the on (up) position, and a 0V to +10V unipolar LFO appears at **OUT B**. Turn the attenuator knob counterclockwise to reduce the peak-to-peak amplitude of the unipolar LFO.

*REMINDER: If nothing is plugged into to **OUT A**, then its value sums with Channel B, offsetting it accordingly. If you don’t want Channel A’s value added to **OUT B**, connect a dummy cable into **OUT A**, or set Channel A’s attenuator to output 0V.*

- **Muting:** Channel C has a dedicated mute switch on its input. This is great for instantaneously adding and removing a control voltage or DC offset to the value appearing at **OUT C/MIX**.

Block Diagram

Below is a block diagram of the signal flow through Triplatt:



Technical Specifications

Width	6 hp
Maximum Depth	21 mm
Current Draw	49 mA @ +12V 25 mA @ -12V